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NOTES ON GEOGRAPHIC DISTRIBUTION

Crustacea, Decapoda, Caridea, Alpheidae, *Alpheus simus* Guérin-Méneville, 1856: Further report from Brazilian waters.

Luis Ernesto Arruda Bezerra [1]
Alexandre Oliveira de Almeida [1, 2]

[1] *Universidade Federal de Pernambuco, Departamento de Oceanografia, Programa de Pós-Graduação em Oceanografia. Avenida Arquitetura s/n, CEP 50740-550, Recife, PE, Brazil.*

[2] *Universidade Estadual de Santa Cruz, Departamento de Ciências Biológicas. Rodovia Ilhéus-Itabuna km 16, CEP 45662-000, Ilhéus, BA, Brazil. E-mail*: aalmeida@uesc.br

The rock-boring snapping shrimp *Alpheus simus* Guérin-Méneville, 1856 is an inhabitant of shallow water reef habitats, from Florida and Yucatan throughout the West Indies (from Cuba to Barbados and Curaçao) south to Brazil (Abrolhos Bank, Bahia) (Chace 1972; Christoffersen 1979). In this species, the rostrum is absent, a feature distinguishing it from all other Brazilian species of the genus *Alpheus* Fabricius, 1798. Moreover, the ocular hoods are rounded and unarmed, and the front is slightly emarginated between them (Chace 1972). Until now, *A. simus* was known from Brazil based on a single record by Christoffersen (1979). His material, referred to as *Thunor rathbunae* (Schmitt, 1924), was collected by R/V "Calypso" in 1961 (Sta. 85), between Santa Barbara Island and Siriba, Abrolhos Archipelago, Bahia, between 2-5 m, on sand and calcareous algae bottoms (Christoffersen 1979).

The present contribution is the second report of *A. simus* from Brazil. Our material was collected in "Parrachos de Maracajaú", Rio Grande do Norte (05°30' S, 35°15' W) (Figure 1), during the project "Macrofauna associated with *Millepora alcicornis* Linnaeus, 1758 (Cnidaria: Hydrozoa)", linked to *Universidade Federal do Ceará*, Fortaleza, Brazil. In the collection site, large beach rocks are known by the local name "Parrachos", and are spread in an area of about 9 km x 2 km, with low tide depths ranging from 1-4 m, approximately 5 km off shore. The water is warm, with temperatures around 28 °C all year round (Feitosa et al. 2002). The shrimp was found associated with the fire coral *Millepora alcicornis*, collected while SCUBA diving. A portion of the coral was removed and preserved in ethanol 70 % for further studies.

The material examined consists of a single male specimen, which was fixed in ethanol 70 %, identified following the key in Chace (1972), and deposited in the carcinological collection of the *Museu de Zoologia*, *Universidade Estadual de Santa Cruz* (MZUESC#995), in Ilhéus, state of Bahia, Brazil.

Figure 1. Presently known range of the snapping shrimp *Alpheus simus* Guérin-Méneville, 1856.

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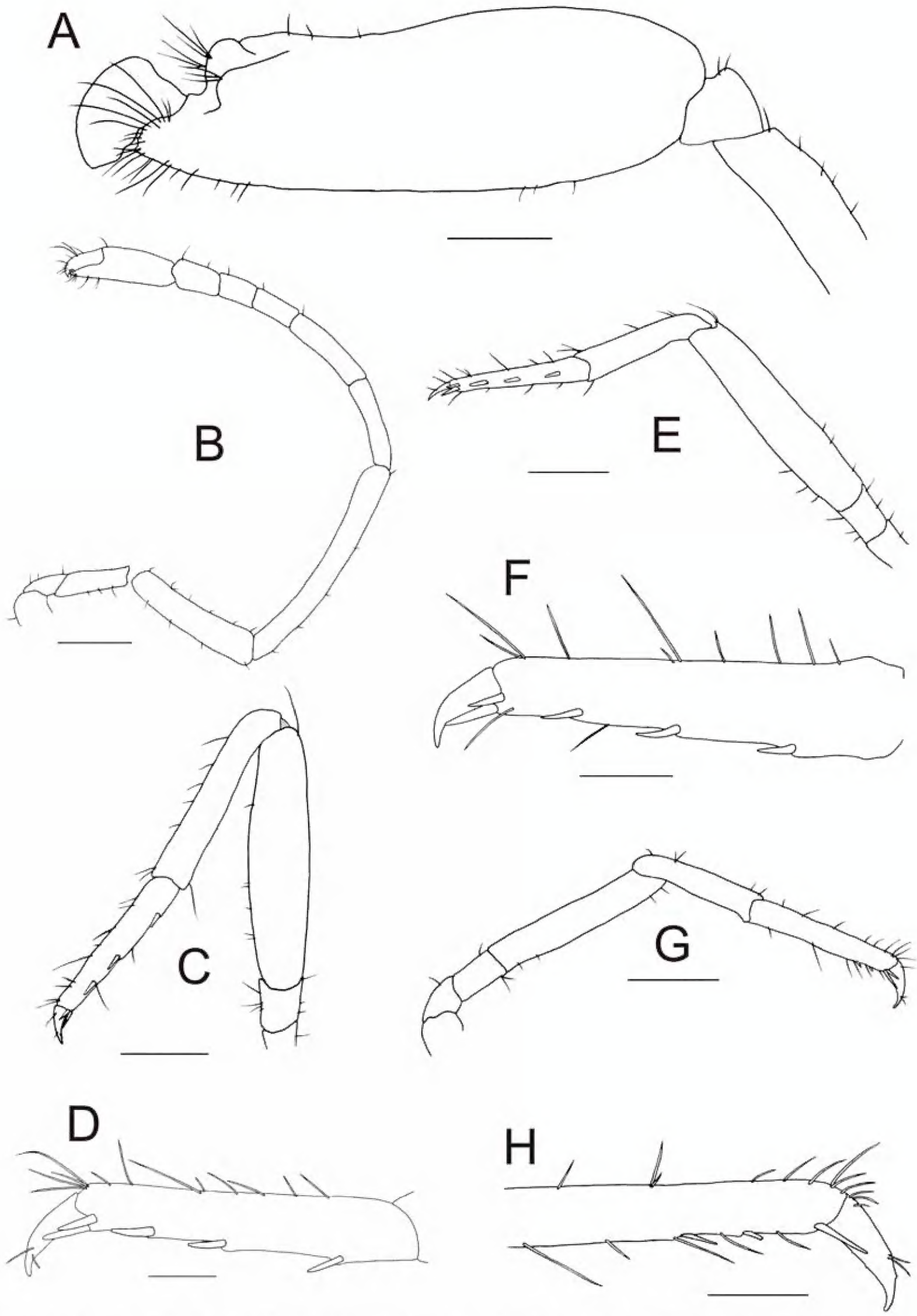

Figure 2. *Alpheus simus* Guérin-Méneville, 1856; male from Parrachos de Maracajaú, Maxaranguape, Rio Grande do Norte, Brazil (MZUESC#955). A, major chela, lateral view; B, left second pereiopod; C, left third pereiopod; D, same, detail of dactylus and propodus; E, left fourth pereiopod; F, same, detail of dactylus and propodus; G, left fifth pereiopod; H, same, detail of dactylus and propodus (second spine of distal pair concealed). In figures C, E, and G, dactylus and propodus are shown in ventral view. Scale bars: A-C, E, and G = 0.5 mm; D, F, and H = 0.25 mm.

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Alpheus simus Guérin-Méneville, 1856
(Figures 2A-H; 3)

Alpheus Simus Guérin-Méneville 1856: 19, pl. 2, fig. 11.

Alpheus simus – Chace 1972: 72; Holthuis 1980: 54; Grajal and Laughlin 1984: 224; Cortes 1985: 351; Werding 1990a: 93; Werding 1990b: 96; Wehrtmann and Albornoz 2002: 605.

Crangon rathbunae Schmitt 1924: 74, pl. 1, figs. 1-10; Holthuis 1955: 92.

Thunor rathbunae Armstrong 1949: 13, figs. 3, 4 A-J, L; Holthuis 1955: 92, fig. 62a; Chace 1972: 104, fig. 39; Christoffersen 1979: 355.

Thunor simus Abele and Kim 1986: 21, 194, 229, figs. g-h; Martínez-Iglesias 1986: 36.

Type locality: Cuba.

Material: 1 male, Brazil, Rio Grande do Norte, Parrachos de Maracajaú (05°30' S, 35°15' W), 3-4 m, on *Millepora alcicornis*, coll. T. M. Garcia, 12.feb.2004 (MZUESC#995). The carapace length is not provided because the carapace has a partial damage.

Habitat: Coral reefs and coral rock bottoms; in crevices of coral rocks and rubble, also in dead portions of living corals; prefers more exposed shores with limpid water.

Remarks: The membranous carapace of the specimen is partially damaged, precluding the drawing of the frontal region. The minor chela and the right second pereiopod are also missing. However, the main diagnostic features of *A. simus* are readily recognized in our specimen, such as the absence of a rostrum, the emarginated front, and the typical hammer-shaped dactylus of the major chela (Figure 2A). The dorsal region of the telson is free of spines; the distolateral angles are each armed with one small subdistal spine; the posterior margin bears three pairs of spines of different length (the submedian pair is the largest and the most-lateral the shortest) in addition to several setae. The propodus of the third and fourth pereiopods has three strong single movable spines, in addition to a distal pair of spines, close to dactylus. The distal pair is also present in the fifth pereiopod, but only two weaker single movable spines are present on the propodus (Figure 2D, F, H).

Figure 3. *Alpheus simus* Guérin-Méneville, 1856, male in dorsal view from Isla Grande, Caribbean coast of Panama. Photo by Arthur Anker.

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Alpheus simus was previously assigned to the genus *Thunor* Armstrong, 1949 (under the names *T. rathbunae* or *T. simus*). Holthuis (1980) revised the synonymy of *A. simus* and compared it with its eastern Pacific sister species *A. saxidomus* Holthuis, 1980. The validity of *Thunor* was questioned by Holthuis (1980) and Williams et al. (2001). The latter authors showed that *Thunor* (represented by *A. simus* and *A. saxidomus*) was embedded within *Alpheus*, thus making *Alpheus* paraphyletic. Therefore, *Thunor* should not be treated as a distinct group of any taxonomic rank until a more complete revision of *Alpheus*.

This snapping shrimp is known to lives in pairs, perforating mainly dead corals (Cortes 1985; Werding 1990a; 1990b). The hatchlings of *A. simus* show a clearly advanced development compared to those of *A. saxidomus*. The development of *A. simus* is abbreviated, most probably direct. Individuals of this species hatch as "decapodid", because they resemble the adult specimens. In its Pacific counterpart, the newly hatched are zoeae. Morphological differences between the larvae of *A. simus* and *A. saxidomus*, and possible reasons for the evolution of different life history traits in so close related species, were discussed by Wehrtmann and Albornoz (2002).

Although very common in suitable habitats in the Caribbean (A. Anker, pers. obs.), *A. simus* appears to be rare in Brazil. The known geographic range of *A. simus* may be disrupted between a northern group in the Florida/Caribbean region and a southern group in northeastern Brazil (Figure 1). This relatively important gap is possibly due to muddy bottoms and low sea water salinity between the huge Orinoco, Tocantins, and Amazon deltas (Coelho 1969; Coelho and Ramos 1972), which are not suitable for development of coral reefs.

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